# Electronics & Electrical Systems I Course No. 40200 Credit: 1.0

|  |  |  |  |
| --- | --- | --- | --- |
| **Student name:** |  | **Graduation Date:** |  |

Pathways and CIP Codes:Mobile Equipment Maintenance (47.9999) - Technology Strand II

Course Description: A comprehensive, **technical level** course designed to provide students with the basic theories, equipment, and skills needed to inspect and service electrical systems.

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: Diagnose and Repair battery starting and charging systems

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Clean and inspect battery clamps, cables, and connectors. |  |
| 1.2 | Perform battery condition tests. |  |
| 1.3 | Jump-start a vehicle. |  |
| 1.4 | Charge and install a battery. |  |
| 1.5 | Diagnose starting system problems and determine necessary action. |  |
| 1.6 | Diagnose starting system problems and determine necessary action. |  |
| 1.7 | Remove, clean, and inspect starter motor and components; reinstall. |  |
| 1.8 | Apply knowledge and understanding of a parasitic drain test. |  |
| 1.9 | Diagnose charging systems and repair or replace components if necessary. |  |
| 1.10 | Remove, clean, inspect ,and reinstall generator (alternator). |  |
| 1.11 | Maintain and restore electronic memory functions; identify and perform required reinitialization or code entry after a battery voltage loss. |  |

## Benchmark 2: Electrical Circuits

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Apply knowledge and understanding of basic electrical theories to construct and analyze all types of basic electrical circuits. |  |
| 2.2 | Utilize electrical system schematics and symbols to locate and identify components and analyze and repair electrical circuits. |  |
| 2.3 | Compute unknown voltages, amperage, and resistances in basic circuit types using Ohms Law. |  |
| 2.4 | Check continuity in electrical circuits using a test light, DVOM. |  |
| 2.5 | Check for shorts, opens, and grounds. |  |
| 2.6 | Measure resistance in electrical circuits using an ohmmeter. |  |
| 2.7 | Measure voltage with a voltage meter. |  |
| 2.8 | Measure current with an ammeter and amp probe. |  |
| 2.9 | Diagnose and repair wires, terminals, and wiring harnesses. |  |
| 2.10 | Use voltage drop test to determine electrical circuit condition. |  |
| 2.11 | Explore module networking communications. |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

CTE Pathways Help Desk

(785) 296-4908

[pathwayshelpdesk@ksde.org](mailto:pathwayshelpdesk@ksde.org)



900 S.W. Jackson Street, Suite 102

Topeka, Kansas 66612-1212

[https://www.ksde.org](https://www.ksde.org/)

The Kansas State Department of Education does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities and provides equal access to any group officially affiliated with the Boy Scouts of America and other designated youth groups. The following person has been designated to handle inquiries regarding the nondiscrimination policies: KSDE General Counsel, Office of General Counsel, KSDE, Landon State Office Building, 900 S.W. Jackson, Suite 102, Topeka, KS 66612, (785) 296-3201.